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The Impact of Big Data on Finance and Its Application in Finance

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Abstract: The rise of finance has been rapid in recent years. Because finance is an important part of macroeconomic regulation in modern economy. Therefore, progress in the financial sector has far-reaching implications for national progress. But as science and technology advance, so does the Internet industry. Through the Internet, we can send massive amounts of data to many locations. The banking sector is also greatly impacted by big data. Big data is applied to the financial sector. Through the library, the Internet, electronic resource database and other ways to read a lot of literature, the status quo and development of big data and finance are understood. This paper provides an explanation of what "big data" is and how it relates to the banking sector. This study elaborates on how financial institutions might make use of big data. The application of big data in the financial industry is very important because the collection and collation of data can help organizations quickly understand consumer preferences. The datacan be used as to make decisions quickly as well.

Keywords: finance, big data, application of big data in finance

1. Introduction

Information technology and the quick growth of new technologies like big data are progressing rapidly in today's era of technological innovation. New technologies are being woven into the fabric of the financial sector [1] to help it flourish. These days, data is one of the most sought-after commodities around. The analysis and implementation of big data are now expanding outside the realm of IT to include other sectors, such as business. The financial services industry now relies heavily on big data, and this technical progress will continue to fuel innovation for years to come. Big data is becoming more and more significant as science and technology advance. From the beginning of information technology to the present in various fields, the technology of big data can reflect its value. Big data has the greatest impact on the financial industry, because data covers a variety of financial services, whether it is online transactions, remittances, or mobile payments. Every second of every day, these financial services produce hundreds or even thousands of data points[1]. Therefore, for the financial industry, it is extremely important to manage these data, because these data can affect the state of the entire industry. Through a literature review, this study investigates the interplay between the big data and financial industry, providing a definition of "big data," elaborating on the nature of the connection between the two, and discussing the potential uses of the concept in finance. These are the central research questions posed by the researcher.

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2. What Is Big Data

Big Data, often known as massive volumes of data, are data sets that are either too large or too complicated to be processed using traditional methods. Large amounts of structured or unstructured data from diverse sources are another way to define big data. From an academic perspective, the rise of big data has sparked original research on a variety of subjects. Various statistical techniques for large data have also been developed as a result of this [2]. In addition, Big data is characterized as a substantial and varied body of information that is expanding rapidly. It details the sheer amount of data, the speed with which it is produced and collected, and the breadth of data it encompasses. There is a wide variety of sources for big data, however data mining is a common one [3].

Big data can be unstructured or organized (typically numerical, readily formatted, and saved) (more free-form, less quantifiable). Nearly every department in a firm may use the results of big data research, but controlling the clutter and noise may be difficult. Personal gadgets and applications, surveys, product purchases, online check-ins, and publicly available comments on social networks and websites are all potential sources of free big data. Conventionally, large datasets are stored in databases and examined using specialized programs designed for such tasks. Big data is an ever-expanding corpus of information that encompasses a wide variety of sources. It includes not only the sheer amount of data, but also its velocity of production and collection, and its breadth of coverage. Data mining is commonly used as a source for big data, which may be available in a variety of formats [3].

3. Big Data's Implications on Financial Markets

Platforms for digital banking, asset management, wealth management, etc. produce enormous volumes of data that must be carefully and accurately handled to prevent data loss.

Big data analytics have provided the financial sector with much-needed flexibility and transparency; this is especially important given that the functionality of any financial organization depends on the security of its data. Thanks to big data, the financial sector no longer has to prioritize security over the provision of enhanced services [4].

Financial markets are always looking for technological innovations for different activities, especially the ones that are always well received.

What has a great impact on the financial market and really changes is the quantity and dissemination process of information, which has a great contribution to the efficiency of the financial market. There is no question that the media is significant in the financial markets. It is thought to be one of the most potent influences on them in this manner. Millions of bits of data on the world's financial markets are produced each day by it[5].

Many financial institutions have already begun testing the waters with big data as a means of guiding daily operations. They started using big data in sales. These applications are in the following.

3.1. The Two Different Types of Customer Profile Applications Are Personal and Business Profiles

3.1.1. Personal Customer Profiles Include Information about Their Ages, Income Levels, Interests, and More

Enterprise customer profiles include production, circulation, and operation, among other things. As a result, banks should think about incorporating more external data in addition to the data they already collect internally to better understand their clients. These include: the first is data on consumer behavior from social media. By merging the bank's internal data with external socialized data, a fuller picture of the customer may be obtained, improving both management and marketing.

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Increased sales and satisfied customers. Businesses can now create analytics platforms that forecast their customers' payment habits thanks to big data technologies.A company can speed up the payment process, raise revenue, and improve customer satisfaction by studying its customers' habits.

The second type of data that e-commerce websites collect is consumer transaction data.

The third is the data about the industrial chain that include the enterprise customers. The bank can more accurately comprehend the evolution of the enterprise's external environment and forecast its future state if it includes data from before and after the company's position in the supply chain.

3.1.2. Precision Marketing

Based on client profiles, banks may execute precision marketing strategies successfully, this includes:

(1). Marketing in real time. Real-time marketing is the advertising that takes into account a customer's current situation, such as the customer's location, recent purchases, and other data to create personalized advertisements.

(2). Cross promotion. Specifically, the cross-recommendation of several companies or goods. For instance, by analyzing customer transaction records, banks may successfully identify small and micro enterprise clients, and then utilize remote banking to perform cross-selling.

(3). Personalized suggestions. Banks can make individualized recommendations for services and banking products by segmenting their clientele based on demographic information such as age, asset size, financial interests, and more in order to analyze their potential financial service needs and sell to them accordingly.

3.1.3. Risk Management and Risk Control

Tools like Small and Medium-Sized Enterprise (SME) Loan Risk Assessment and Fraud Detection are a part of this framework for managing and controlling risks.

Another use of big data in finance can be seen here. Banking organizations must set up a strong risk management system in order to prevent significant revenue losses. Big data analytics has made it possible to detect risks in real-time and protect customers from fraud. Although the quickly expanding digital world has been very beneficial, it is not without its share of scams and frauds. Today's most significant challenge for the banking industry is the rise in cyberattacks that have exposed the vulnerability of sensitive customer data. However, unusual user behavior and spending patterns have made it possible for financial organizations to quickly identify frauds and scams thanks to big data analytics and machine learning algorithms.

3.1.4. Operational Optimization

(1). Analysis and optimization of the market and channels. (1) Banks can use big data to assess the performance of various marketing channels, especially online ones, and then modify and enhance their cooperation channels based on the results. At the same time, it may assess which channels are more effective for marketing various banks products and services, allowing for the improvement of channel promotion tactics.

(2). The enhancement of both products and services. Banks may interpret their customers' actions into data flows, allowing them to learn about their personalities and the risks they're willing to take, gain a deeper understanding of customer habits, implement product innovation and service optimization strategies after carefully analyzing and anticipating client demands. Industrial Bank, for example, currently conducts preliminary big data analysis, uses repayment data mining and compares to identify high-quality customers. It also bases its financial product and service differentiation on variations in customer repayment amounts.

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(3). Research on the general public's sentiment. To swiftly understand unfavorable information about banks and bank products and services and deal with concerns as they arise, banks can employ language technology to make positive and negative judgements. Crawler technology can be used by banks to collect pertinent information about them, their products, and services in online communities and forums.

Additionally, Internet credit service providers are significantly impacted by big data. The capacity to appraise more debtors, even those in bad financial condition, is the first result. Big data is also important in credit rating agencies. Financial systems efficiently manage credit risk by using transparent information methods. By combining the benefits of cloud computing and information technology, big data has the potential to enhance the market-based credit system for businesses and consumers alike.

Big data is playing a bigger role in risk assessments. By enhancing model quality, particularly with the aid of application, it has an impact on risk management. Additionally, compared to conventional systems, it generates and translates risk analysis data more quickly. Furthermore, by combining internal and external data on issues like money laundering, credit card fraud, and others, it facilitates the identification of fraud by minimizing manual work.

Additionally, it helps with data storage and the enhancement of computing efficiency.

Enabling risk analysts to assess preliminary data and create plans to address market threats.

4. Conclusion

To conclude, big data has a huge impact on finance, not only because of the development of science and technology, but also related to the progress of the times and the needs of finance. There are advantages and disadvantages to the growing availability of data. In order to improve customer satisfaction and repeat business, companies should be able to better customize their products and marketing campaigns to the needs of their customers (and future customers). Businesses can use large data sets to their advantage by doing more in-depth analysis. Though improved analysis is always welcome, too much data can lead to information overload and noise, diminishing the benefits. Data is becoming increasingly important to businesses, but it can be difficult to sort out the useful information from the noise. An important choice must be made regarding what makes the data relevant. Furthermore, further administration may be required before to usage depending on the data's type and format. Numbers and other logical data representations make up the bulk of structured data. Emails, videos, and written documents are all examples of unstructured data. It is possible that further cutting-edge methods will be required.

In finance, large data presents some difficulties. The financial sector is subject to stringent reporting and access controls because to regulations like the Fundamental Review of the Trading Book (FRTB). Innovative big data technology may allow financial organizations to scale up risk management in a cost-effective manner. Upgrades to reporting and metrics assist handle data analytically and derive the desired understanding. Because of an increase in sophisticated cybercriminals, financial institutions must implement strict data governance regulations to mitigate the dangers posed by ongoing attacks. Big data management technologies safeguard sensitive information and promptly flag any dubious behavior.

This paper also has some limitations. First of all, the literature collected in this paper is not so comprehensive, which limit the scope of the literature involved in answering the research questions and further affecting the author’s capacity to answer these research questions. In addition, to the perspectives of the author, some one-sidedness of this paper lead to partial answers to the research questions. Thus, many knowledge points made reflect partial understanding of the author. These knowledge points have not been thoroughly demonstrated, either.

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